

REMARKS/ARGUMENTS

Claims 1-4 and 6-25 and new Claim 26 are active in the present application.

Reconsideration is respectfully requested.

Examiner Egwim is thanked for the helpful and courteous interview of June 28, 2006. As a result of the discussion it is believed that the prosecution of the application has been advanced.

Claim Amendments

The claims have been amended to make several minor changes thereto and to introduce new Claim 26, the subject matter of which is supported by page 7, lines 9-14 of the specification. Entry of the amendments and new claim into the record is respectfully requested.

Prior Art Rejection

Claims 1-4, 6, 7 and 15 stand rejected based on 35 USC 103(a) as obvious over Satoh et al, U. S. Patent 4,485,225, Jenkins et al, U. S. Patent 4,449,186, each with Moritani et al, U. S. Patent 5,744,547. This ground of rejection is respectfully traversed.

Although the Satoh et al and Jenkins et al patents disclose methods of polymerizing ethylene and vinyl acetate monomers, neither reference shows or suggests the preparation of a saponified EVOH copolymer that contains a compound that has at least one conjugated carbon-carbon double bond and that has a molecular weight of at most 1000. Further, the references do not suggest an EVOH material that has a specific methoxy group content. Moreover, although the Satoh et al patent discloses, as an objective of the invention described, the objective of inhibiting gel formation in the preparation of ethylene/vinyl acetate copolymers, this is achieved by polymerizing the two monomers in the presence of a

solvent and a radical initiator whose half life at 60° C is not longer than 2 hours. Another factor which influences gel formation is the average residence time of material in the polymerization vessel, i.e., the longer the average residence time, the greater the amount of gel produced. Neither of these factors are the noteworthy features of the presently claimed invention. In the case of the Jenkins et al patent the objective is an improvement in the production of ethylene/vinyl acetate copolymer which are achieved by copolymerizing ethylene and vinyl acetate in a continuous feed of the comonomers and reaction in a vessel under the conditions of (a) to (c) of the claims and continuous withdrawal of product from the reaction vessel. There is no disclosure of minimizing gel formation in the product copolymer by the process conditions disclosed and claimed. Clearly, the cited two patents do not suggest the present invention considered either alone or in combination.

Applicants emphasize that the specific objective desired to be achieved in the present invention is not the same as the objectives sought after in the applied prior art. As stated in the discussion of the prior art on page 1, lines 15-23 of the specification, it is well known that EVOH resin often exhibits "streaks" in the extrusion processing of the resin to form products. This problem has been one of long-standing in the art, because the presence of these streaks detracts from the commercial value of the EVOH products, as they appear on the surfaces of the EVOH products. Moreover, this problem is **different from other product degrading features of the EVOH which are "skin roughness" and "fish eyes," "hard spots" and other discontinuities that appear on the surface of the EVOH products.** The Jenkins et al patent is completely silent as to the surface appearance characteristics of EVOH products. Moreover, Satoh et al makes no mention of the surface appearance problem of streaks on EVOH products. Instead, the technique disclosed in the patent is a method of copolymerizing ethylene and vinyl acetate without causing gel formation within the polymer product. As noted in the discussion above, the problem of gel formation (fish eyes) in EVOH is a problem

distinct from that which the present invention addresses. In the present invention the presence of methoxy groups in the EVOH and the incorporation of the compound that contains at least one conjugated carbon-carbon double bond and that has a molecular weight of at most 1000 is most important. This fact is clearly evident from the comparative evidence provided in Tables 1 and 2 of the present text. Example 1 is a formulation that is within the scope of the present invention because the EVOH copolymer has a methoxy group content of 0.01 mol % and contains a compound having at least one conjugated carbon-carbon double bond and a molecular weight within the claimed range. Comp Ex 1, on the other hand, is an EVOH material that does not contain methoxy groups and does not contain a compound having a conjugated double bond, while Comp Ex 2 is an EVOH formulation that while it contains a compound having at least one conjugated carbon-carbon double bond and has a molecular weight within the claimed range, the EVOH does not, however, contain methoxy groups. In Comp Ex 3, while the EVOH component contains methoxy groups, the formulation does not contain a compound that contains at least one conjugated double bond. The test data in Table 2 of the specification show that while a formulation within the scope of the present invention has excellent surface smoothness, melt extrusion stability and drawdown resistance properties, this is not the case of the formulations of Comp Exs 1-3.

As mentioned above, neither the Sato nor the Jenkins reference teaches or suggests an EVOH that has a specific methoxy group content. Even if there was such an admission on the record of the case, one of skill in the art could not predict the effects of methoxy group content on the appearance of streaks, when the groups are present in combination with C=C group containing compounds. This is clear from the data in Table 1 of the text in Comp. Exs. 1 and 3. Comp. Example 1 shows that the EVOH material contains no methoxy groups and that the formulation does not contain a compound that contains C=C bonds. In Comp Ex 3, the EVOH material contains methoxy groups but the formulation does not contain a

compound that contains C=C bonds. Note that for both formulations each was rated as having a surface smoothness value of "C." That is, by just incorporating methoxy groups into the EVOH material, the surface smoothness of the product could not be improved. Accordingly, even if someone tried to improve surface smoothness (decreased streaking) by methoxy groups into the EVOH material, he would not achieve the expected result. One of skill in the art would have no motivation to incorporate methoxy groups in the EVOH material in order to improve surface smoothness.

Applicants submit that one of skill in the art, considering the cited Satoh et al and Jenkins et al patents, would not be led by the cited prior art to the present formulation as claimed, and certainly not to a means of specifically improving upon the problem of the formation of streaks in the surface of EVOH product which is not mentioned in either of the two references.

As to the Moritani et al patent, although the same discloses an ethylene/vinyl alcohol copolymer formulation that contains a polyene which is defined as a compound that contains alternating carbon-carbon double bonds, there is not the slightest indication that the EVOH material of the patent contains methoxy groups. Note at this point of the discussion that the objective sought after by patentee again is **not to improve upon** the problem of surface streaks in EVOH material, but to improve upon the separate problems of coloring of the EVOH product and the appearance of gel-like agglomerates in the copolymer. So, of course, Moritani neither discloses nor suggests the addition of a C=C group containing compound. In fact, the presence of a C=C group containing compound has a poor effect on improving surface smoothness. This is specifically shown in Comp. Ex 2 where the formulation contains a C=C group containing compound (DPMP), but the saponified ethylene vinyl acetate resin has no methoxy group content. Table 2 shows that the surface smoothness of the product of Comp Ex 2 is poor at a rating of "C." In other words, by simply adding a C=C group

containing compound to an EVOH material, the surface smoothness of the product could not be improved and therefore no motivation exists to add a C=C group containing compound to an EVOH material in order to improve surface smoothness. (Comp Ex 1, when taken together with Comp Ex 2, clearly shows the lack of motivation.) On the other hand, in order to achieve the specific improvement of the present invention, the EVOH material must contain the stated quantity of methoxy groups and the compound containing at least one conjugated double bond. Moreover, as is evident from the discussion above, Tables 1 and 2 of the present specification show that the resin formulation of the present invention possesses additional advantages as a result of the incorporation of the specific compound containing unsaturation and of specified molecular weight and having the stated methoxy group content. Thus Example 1 of the invention not only has good surface smoothness, it also possesses excellent melt extrusion stability and excellent drawdown resistance characteristics. On the other hand, the composition of Comp. Ex 2, which is consistent with the composition shown in Moritani et al., because it contains a polyene (DPMP) but has no methoxy group content, exhibits notably inferior melt extrusion stability and drawdown resistance properties. There is no suggestion of the present EVOH formulation in Moritani et al., and no suggestion of the significant and superior properties of the present resin formulation.

It may seem an easy thing to do to combine Sato and Moritani to obviate the present invention, but, of course, it is highly improper to combine the reference when one has the teachings of the present specification in hand to provide the motivation to combine the two references. In fact, at the time of the present invention, the addition of many compounds to EVOH was well known as a means of modifying EVOH in order to improve EVOH quality. If all of these combinations had been tried, although nothing of the specific effect of the present invention is suggested in the prior art, the combinations of compounds with EVOH would be enormous. Accordingly, in order to demonstrate the specific effect of the present

invention with its specific combination of modified EVOH and a C=C group containing compound is far from easy. Accordingly, Moritani et al., considered alone or in combination with the above discussed patents does not obviate the invention as claimed and withdrawal of the obviousness ground of rejection is respectfully requested.

The arguments advanced above against the cited references apply equally as well to the obviousness ground of rejection of paragraph 4 of the Office Action.

As to the matter of the obviousness ground of rejection of paragraph 5, applicants note that Claims 8-11 and 16 are dependent claims which depend ultimately on Claim 1 and therefore incorporate the distinctive features of the EVOH formulation of Claim 1 therein. Accordingly, the secondary prior art that has been cited does not improve upon the deficiencies of the prior art with respect to this invention and withdrawal of the obviousness ground of rejection is respectfully requested. Much the same argumentation applies to the obviousness rejection of paragraph 6 of the Office Action and accordingly, withdrawal of this obviousness ground of rejection is respectfully requested

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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